

**2024 Survey Report
for
Foraging Crotch's Bumble Bee
(*Bombus crotchii*)
on the
Woodward Specific Plan Development Project**

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August 15, 2024



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INTRODUCTION

This report documents the methods and results of a survey conducted on the Woodward Specific Plan Development Project site for foraging Crotch's bumble bee (CBB; *Bombus crotchii*), a candidate for listing as endangered under the California Endangered Species Act (CESA). The study area encompasses approximately 27 acres of vacant and developed land located within the City. This area includes the approximately 8.5-acre proposed project site and designated 200-foot buffer. The study area is bordered to the south by East Mission Road and to the west by North Twin Oaks Valley Road. Woodward Street bisects the study area at the western boundary of the project site (Figures 1 and 2). The study area is located within the United States Geological Survey (USGS) San Marcos 7.5-minute topographic quadrangle.

METHODS

A foraging bumble bee survey for the CBB was conducted during the period May 16 through July 12, 2024 (Table 1). The survey followed the Survey Considerations for CESA Candidate Bumble Bee Species issued by the CDFW on June 6, 2023.

Table 1 2024 Crotch's Bumble Bee Survey Information				
Site Visit #	Date	Biologist(s)	Survey Times (start-stop)	Weather Conditions (start/stop)
1	5/16	Brian Lohstroh	1000-1445	50% cover, 65°F, wind 0-3 mph/ 40%, 73°F, wind 3-8 mph
2	6/6	Brian Lohstroh	1000-1445	50% cover, 73 °F, wind 5-8 mph/ 0%, 82°F, wind 6-10 mph
3	7/12	Brian Lohstroh	0830-1345	40% cover, 73°F, wind 1-5 mph/ 20%, 86°F, wind 2-8 mph

Prior to beginning the survey, a habitat assessment was conducted to identify suitable foraging habitat for the CBB. The assessment included reviewing California Department of Fish and Wildlife (CDFW) Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species (2023), as well as reviewing available bumble bee data (iNaturalist and Bumble Bee Watch) and California Natural Diversity Database (CNDDB) to identify any reported CBB observations in the site vicinity. In addition, current vegetation mapping prepared for the project, historic aerial photographs, and site photographs were reviewed to identify areas that may support suitable foraging resources (flowering plants) for the species as well as nesting locations. Potential habitat for the CBB on site was determined from those existing conditions.

According to the Survey Considerations (CDFW 2023), it is recommended that at least 3 site visits take place spaced 2 to 4 weeks apart during the period of highest detection probability for foraging CBB (i.e., the April – August Colony Active Period for the species) and when floral resources are

present. Three site visits were made to the survey area approximately 3-5 weeks apart during the Colony Active Period when floral resources were present (Table 1).

The Survey Considerations (CDFW 2023) state that site visits should be made at least 1 hour after sunrise and at least 2 hours before sunset, although ideally between 9 am and 1 pm on warm, but not hot, sunny days (65-90 degrees Fahrenheit) with low wind (less than 8 miles per hour). The recommended rate of survey is 1 person-hour per 3 acres of suitable habitat. The survey was conducted under these conditions (Table 1; Appendix A).

The survey included walking meandering transects through the survey areas and looking for foraging *Bombus* species. All flowering plants in bloom, as well as bee/wasp species, were recorded in field notes during each site visit (Appendix A). No netting or handling of any insects was conducted. The entirety of the survey area was surveyed 3 times.

Approximately 14 acres within the study area were determined to support flowering plants where the CBB could forage. This acreage is dominated by Diegan Coastal Sage Scrub (DCSS) and disturbed DCSS habitats. Total flower coverage in the survey area ranged from 10% to 50% throughout the 3 surveys.

The remaining 13 acres is not suitable for CBB, as it contains no flowers and is either developed or highly disturbed.

RESULTS

The nearest record of the species is an iNaturalist research grade record from March 2024, approximately 1.15 miles to the west of the site, in an undeveloped area just east of the Edwin and Francis Hunter Arboretum. CNDDDB records indicate this species has been recorded on June 15, 2020, approximately 2.5 miles from the project site within the San Marcos Double Peak Park.

One CBB was observed during the 6/6 survey within the project boundary in the southern central portion of the study area. Additional *Bombus* species were also observed during each of the three surveys. Twelve Yellow-faced bumble bees (*Bombus vosnesenskii*), including one queen, were observed on 5/16; twenty five, including one male, were observed on 6/6; and sixteen were observed on 7/12. Sixteen California bumble bee (*Bombus californicus*) were also observed on 7/12. Other bee and wasp species observed throughout the survey included the European honey bee (*Apis mellifera*), Hover fly (*Syrphidae*), tarantula hawk (*Pepsis thisbe*), Robber fly (*Asilidae*), California digger bee (*Anthophora californica*), Mexican cactus fly (*Copestylum mexicanum*), carpenter bee (*Xylocopinae*), and Fig eater beetle (*Cotinis mutabilis*).

The DCSS habitat (including disturbed) on site supports suitable foraging and nesting resources for bumble bees as this habitat contains substantial nectar resources and burrowing animal species (lizards, gophers, etc). Therefore, the site is considered suitable nesting and foraging habitat for species.

REFERENCES

Bumble Bee Watch, September 14, 2024. <https://www.bumblebeewatch.org/maps>

California Department of Fish and Wildlife. 2023. Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species. June 6. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=213150&inline>

iNaturalist, September 14, 2024.
https://www.inaturalist.org/observations?place_id=any&subview=map&taxon_id=271451

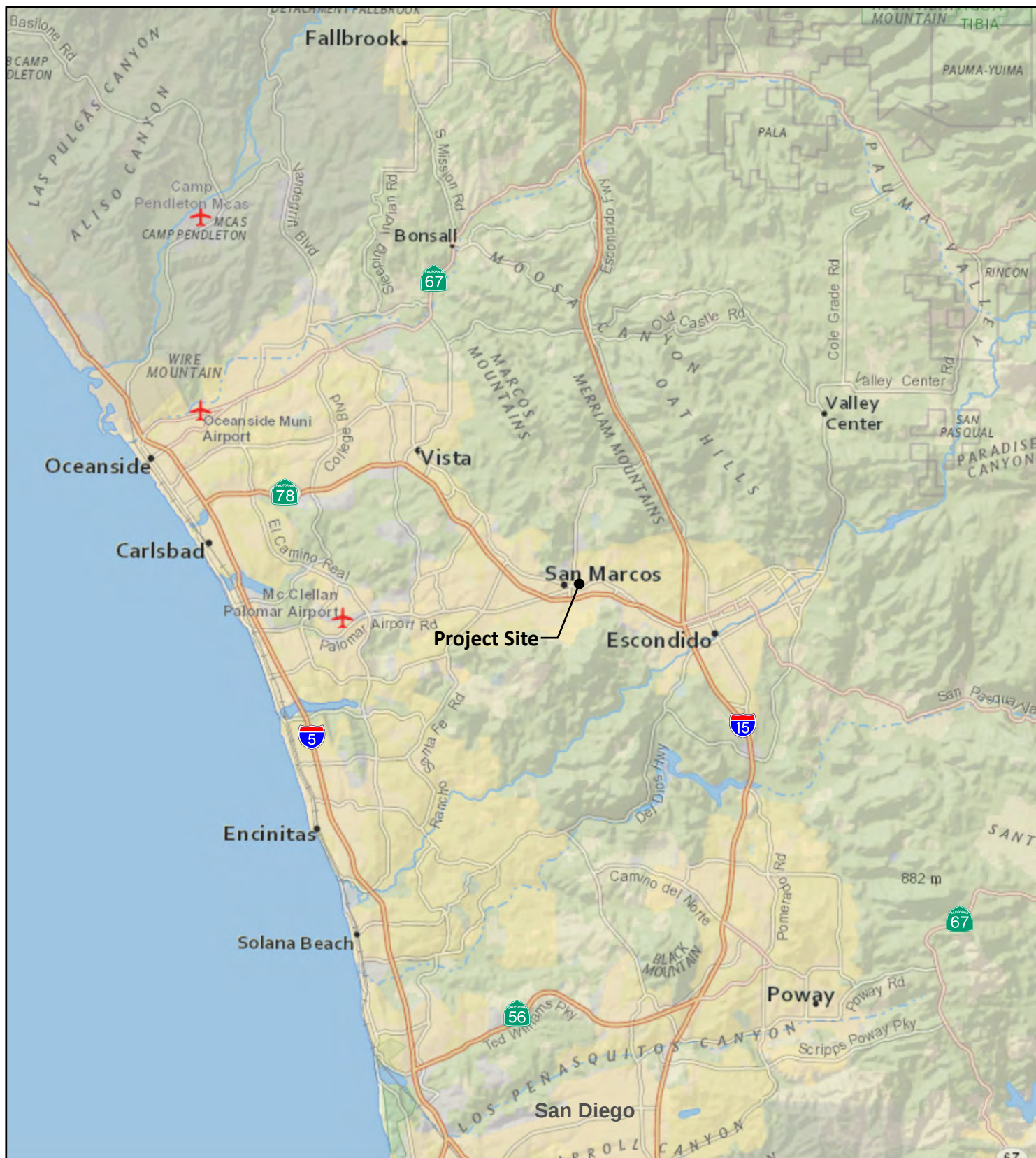
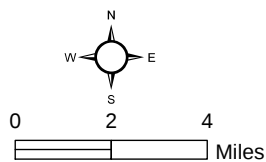


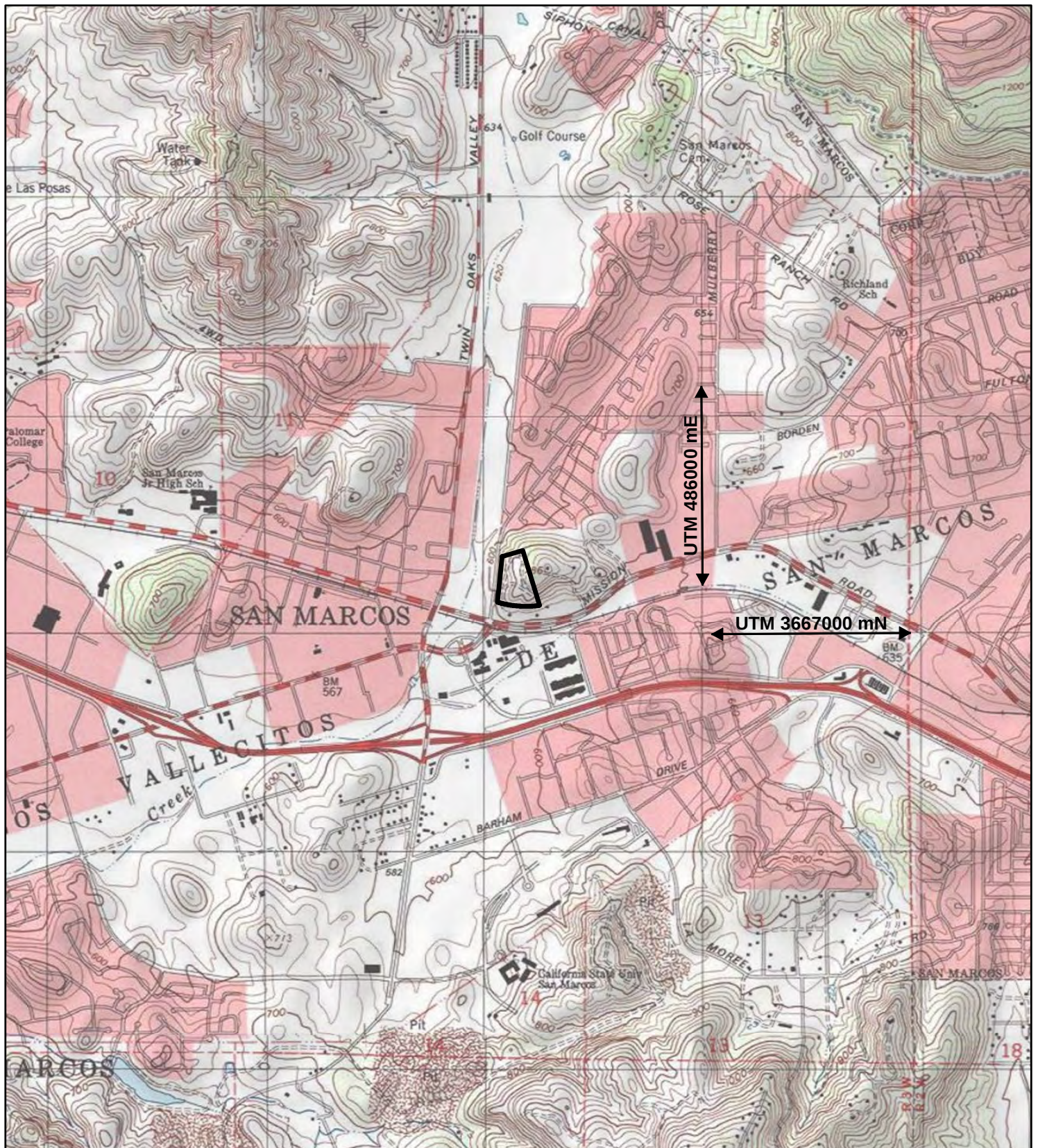
Figure 1

Regional Location

WOODWARD SPECIFIC PLAN
DEVELOPMENT PROJECT
CROTCH'S BUMBLE BEE SURVEY

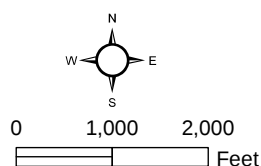


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 Project Boundary

Source: USGS Quads (San Marcos) Copyright: © 2013 National Geographic Society, i-cubed

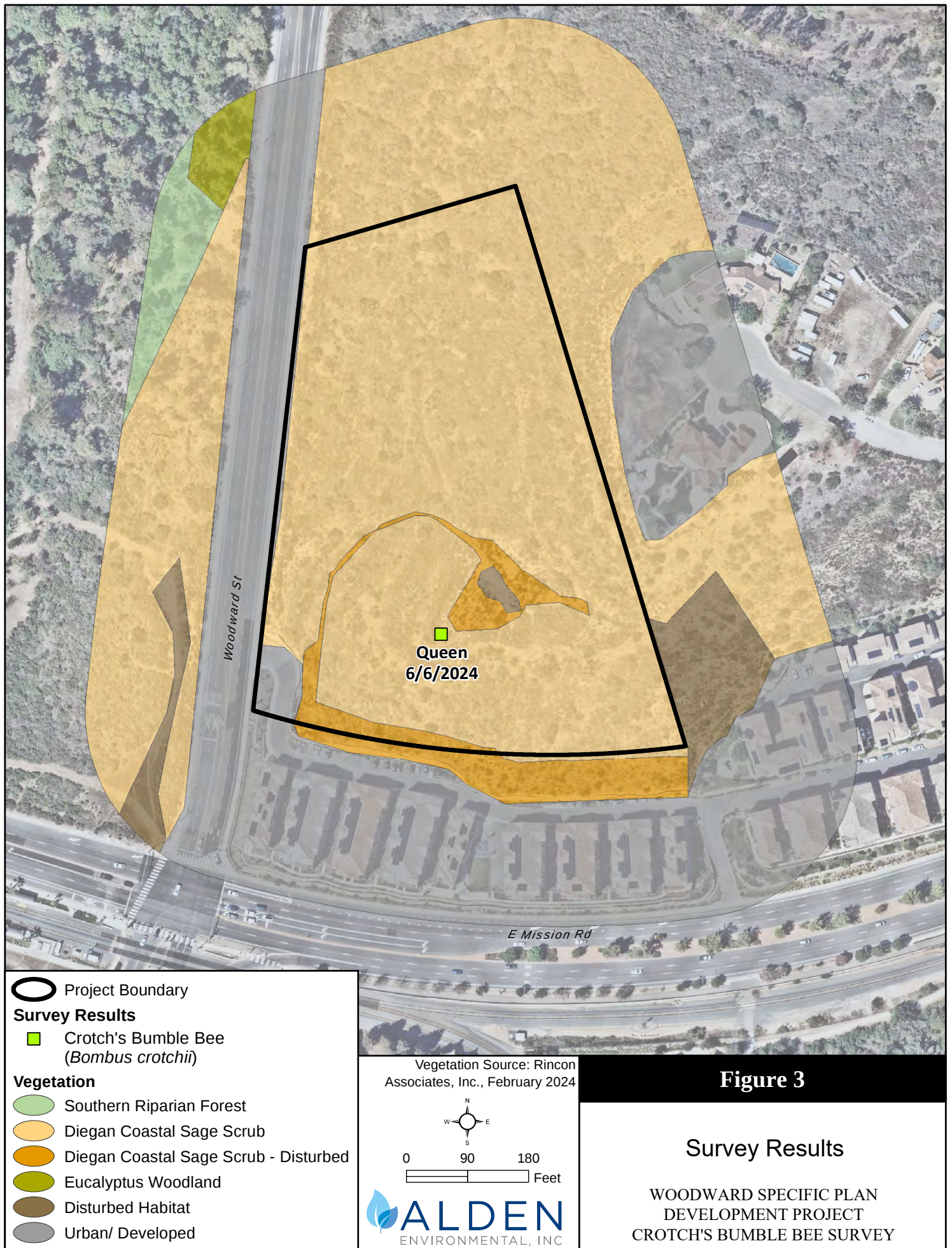


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Figure 2

Project Location

WOODWARD SPECIFIC PLAN
DEVELOPMENT PROJECT
CROTCH'S BUMBLE BEE SURVEY



Attachment A

Survey Field Forms

Crotch's Bumble Bee Survey Form

Project: Woodward 46 Project Date: 5/16/24

Surveyor: [Brian Lohstroh](#) Survey Polygon: [NA](#) Survey Number: [1](#)

Acres Surveyed: 14 Survey Time: 4:45 Acres per Hour: 2.94

Other Surveyors Present: None

[illegible]

Habitat Photographs

5/16/24, Woodward 46



Crotch's Bumble Bee Survey Form

Project: Woodward 46 Project Date: 6/6/24

Surveyor: Brian Lohstroh Survey Polygon: NA Survey Number: 2

Acres Surveyed: 14 Survey Time: 4:45 Acres per Hour: 2.94

Other Surveyors Present: None

Field Conditions				
	Time (24 hr)	Temperature (°F)	Wind Speed (mph)	Cloud Cover
Start	1000	73	5-8	50%
End	1445	82	6-10	0%
Start				
End				
Vegetation Communities Surveyed (inc. dominant spp.)				
CSS: SALMEL, ARTCAL, ERIFAC, MALLAU.				
Site conditions: Approx 50% floral cover, dominated by SALMEL				
Bumble Bee Species (<i>Bombus</i> spp.)	#	Other Hymenoptera (Bee/Wasp) Species	Obs.	
California bumble bee (<i>B. californicus</i>)		western honey bee (<i>Apis mellifera</i>)	✓	
Crotch's bumble bee (<i>B. crotchii</i>) (Queen)	1	Hover fly (<i>Syrphidae</i>)	✓	
Fernald cuckoo bumble bee (<i>B. flavidus</i>)		drone fly (<i>Eristalis tenax</i>)		
black tail bumble bee (<i>B. melanopygus</i>)		tarantula hawk (<i>Pepsis thisbe</i>)	✓	
Sonoran (American) bumble bee (<i>B. sonorus</i>)		Mexican cactus fly (<i>Copestylum mexicanum</i>)		
Vancouver bumble bee (<i>B. vancouverensis nearcticus</i>)		California digger bee (<i>Anthophora californica</i>)		
Van Dyke bumble bee (<i>B. vandykei</i>)		carpenter bee (Subfamily: Xylocopinae)	✓	
Yellow-faced bumble bee (<i>B. vosnesenskii</i>) Incl. 1 male	25	Golden paper wasp (<i>Polistes aurifer</i>)		
Column Total	26	Scoliid wasp (<i>Scoliidae</i>)		
Nectar/Pollen Sources Present (*CBB preferences)				
deerweed (<i>Acmispon glaber</i>) <i>B. vos</i> nectaring	✓	lupine (<i>Lupinus</i>)*		
onion (<i>Allium</i> spp.)		bur-clover (<i>Medicago</i>)*		
fiddleneck (<i>Amsinckia</i> spp.)		penstemon (<i>Penstemon</i>)		
snapdragon (<i>Antirrhinum</i>)*	✓	phacelia / scorpionweed (<i>Phacelia</i>)*		
manzanita (<i>Arctostaphylos</i>)		popcorn flower (<i>Cryptantha/Plagiobothrys</i>)		
milkweed (<i>Asclepias</i>)*		sage (<i>Salvia</i>)* <i>melliera, apiana B. vos, crotchii</i> nectaring	✓	
milk-vetch (<i>Astragalus</i>)		ragwort (<i>Senecio</i>)		
goldenstar (<i>Bloomeria</i> spp.)		clover (<i>Trifolium</i>)		
Lilac/buckthorn (<i>Ceanothus</i>)		vetch (<i>Vicia</i>)*		
pincushion (<i>Chaenactis</i>)*		Other: <i>Hirschfeldia incana</i>	✓	
thistle (<i>Cirsium</i>)*	✓	<i>Mirabilis laevis</i>	✓	
clarkia (<i>Clarkia</i>)		<i>Eriophyllum confertiflorum</i>	✓	
bird's beak (<i>Cordylanthus</i>)		<i>Malacathamnus fasciculata</i>	✓	
fascicled tarweed (<i>Deinandra fasciculata</i>)	✓	<i>Scrophularia californica B. vos</i> nectaring	✓	
larkspur (<i>Delphinium</i>)*		<i>Solanum parishii</i>	✓	
buckwheat (<i>Eriogonum fasciculatum</i>)	✓	<i>Diplaucus</i> sp.	✓	
sunflower (<i>Helianthus</i>)		<i>Echium candicans</i>	✓	
telegraph weed (<i>Heterotheca</i>)		<i>Opuntia</i> sp.	✓	
goldfields (<i>Lasthenia</i> spp.)		<i>Sambucus nigra</i>	✓	
honeysuckle (<i>Lonicera</i>)				
Crotch's Bumble Bee Observation(s) Log				
Time	Photo(s)	No.	Notes (Habitat, Nectar/Pollen Source, Behavior)	
12:18p	Yes	3	Suspected queen (large size) foraging on <i>Salvia mellifera</i> . Departed to south, downslope.	

Habitat Photographs

6/6/24, Woodward 46



Project: Woodward 46 Project Date: 7/12/24

Surveyor: Brian Lohstroh Survey Polygon: NA Survey Number: 3

Acres Surveyed: 14 Survey Time: 5:15 Acres per Hour: 2.67

Other Surveyors Present: None

[illegible]

Habitat Photographs

7/12/24, Woodward 46

